



Exelon Generation®

Clinton Power Station
8401 Power Road
Clinton, IL 61727

U-604482
April 24, 2019

10 CFR 50.73
SRRS 5A.108

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Clinton Power Station, Unit 1
Facility Operating License No. NPF-62
NRC Docket No. 50-461

Subject: Licensee Event Report 2018-005-02

Enclosed is Licensee Event Report (LER) 2018-005-02: Unplanned Reactor Scram During Maintenance Outage Due to High Intermediate Range Monitor Flux. This is a supplemental report to LER 2018-005-01 submitted to the NRC on March 5, 2019. The updated information in the LER is denoted by revision bars located in the right-hand margin. This report is being submitted in accordance with the requirements of 10 CFR 50.73.

There are no regulatory commitments contained in this report.

Should you have any questions concerning this report, please contact Mr. Dale Shelton, Regulatory Assurance Manager, at (217) 937-2800.

Respectfully,

John J. Kowalski
Plant Manager
Clinton Power Station

Attachment: Licensee Event Report 2018-005-02

cc:

Regional Administrator - Region III
NRC Senior Resident Inspector - Clinton Power Station
Office of Nuclear Facility Safety - Illinois Emergency Management Agency

IE22
NRR

**LICENSEE EVENT REPORT (LER)**

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. Facility Name

Clinton Power Station, Unit 1

2. Docket Number

05000461

3. Page

1 OF 3

4. Title

Unplanned Reactor Scram During Maintenance Outage Due to High Intermediate Range Monitor Flux

5. Event Date

Month	Day	Year
10	28	2018

6. LER Number

Year	Sequential Number	Rev No.
2018	005	02

7. Report Date

Month	Day	Year
4	24	2019

8. Other Facilities Involved

Facility Name	Docket Number
	05000

9. Operating Mode**11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)**

2

<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)

10. Power Level

<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
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<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(1)
<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(2)(i)
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(ii)
	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> Other (Specify in Abstract below or in NRC Form 366A)	

12. Licensee Contact for this LER**Licensee Contact**

Mr. Dale Shelton, Regulatory Assurance Manager

Telephone Number (Include Area Code)

(217) 937-2800

13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable to ICES	Cause	System	Component	Manufacturer	Reportable to ICES
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14. Supplemental Report Expected**15. Expected Submission Date**☐ Yes (If yes, complete 15. Expected Submission Date) ☒ No

Month	Day	Year
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Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

On October 28, 2018, at 0445 CDT at approximately 0.5% power while performing a soft shutdown in support of a planned maintenance outage (C1M23), the plant experienced an unplanned Reactor Protection System (RPS) actuation due to Intermediate Range Monitors (IRMs) High Flux. At the time of the event Main Steam Line (MSL) drains were being closed to control the reactor cooldown rate. When MSL drain isolation valve 1B21-F016 was full closed, pressure reduction (cooldown) stopped resulting in a small reactor water level change and the Feedwater system responded by injecting a small amount of cold water. This combination of conditions resulted in a positive reactivity change which resulted in the reactor scram. A review of the Feedwater system response determined that the system responded as designed and no equipment failure initiated the conditions leading to the scram. The cause of the event was pressure control guidance was not adequate to address the cooldown rate conditions during a soft shutdown. Corrective actions include implementing best practices for pressure control strategies, abort criteria based on reactor pressure, actions to minimize time in the region of vulnerability, and associated operator training. This event is reportable under the provisions of 10 CFR 50.73(a)(2)(iv)(A) as an "event or condition that resulted in the manual or automatic actuation of the Reactor Protection System."



LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

(See NUREG-1022, R.3 for instruction and guidance for completing this form
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
Clinton Power Station, Unit 1	05000461	YEAR	SEQUENTIAL NUMBER	REV NO.
		2018	- 005	- 02

NARRATIVE

PLANT AND SYSTEM IDENTIFICATION

General Electric -- Boiling Water Reactor, 3473 Megawatts Thermal Rated Core Power
Energy Industry Identification System (EIS) codes are identified in text as [XX].

EVENT IDENTIFICATION

Unplanned Reactor Scram During Maintenance Outage Due to High Intermediate Range Monitor Flux

A. Plant Operating Conditions Before the Event

Unit: 1	Event Date: October 28, 2018	Event Time: 0445
Mode: 2	Mode Name: Startup	Reactor Power: 0.5 percent

B. Description of Event

On October 28, 2018 at 0445 CDT at approximately 0.5% power while performing a soft shutdown in support of a planned maintenance outage (C1M23), the plant experienced an unplanned Reactor Protection System (RPS) actuation due to Intermediate Range Monitors (IRMs) [IG] High Flux. At the time of the event Main Steam Line (MSL) drains were being closed to control the reactor cooldown rate. When MSL drain isolation valve 1B21-F016 was full closed, pressure reduction (cooldown) stopped resulting in a small reactor water level change and the Feedwater system [SJ] responded by injecting a small amount of cold water.

A review of the motor driven reactor feedwater pump (MDRFP) injection valve 1FW004 response during the event determined that the valve had responded as designed under the low feedwater demand conditions that the scram experienced.

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

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Clinton Power Station, Unit 1	05000461	2018	- 005	- 02

NARRATIVE**C. Cause of the Event**

The root cause of this event was that procedure pressure control guidance was not adequate to address the cooldown rate conditions during a soft shutdown.

D. Safety Consequences

This event is reportable in accordance with 10 CFR 50.73(a)(2)(iv)(A) as "any event or condition that resulted in the manual or automatic actuation of the Reactor Protection System."

The scram caused by increased flux to the IRMs involved no safety consequences or failures of plant equipment. The condition of the reactor core at the time of the event was stable. Systems necessary to maintain the plant per Technical Specification requirements following the automatic plant trip performed as expected and remained available to perform their safety function.

E. Corrective Actions

As an interim corrective action, following the reactor scram, Procedure 3006.01, Unit Shutdown, was revised to include Appendix F, Plant Shutdown Briefing Topics, specific to performance of a soft shutdown. The procedure revision indicates that soft shutdowns are prohibited until further notice and it prohibits forced cool down until all control rods are fully inserted.

Further corrective actions taken include revising Procedure 3006.01 to implement best practices for pressure control strategies, abort criteria based on reactor pressure, and actions to minimize time in the region of vulnerability. Associated operator training has been updated to incorporate the procedure changes and lessons learned from this event.

F. Previous Similar Occurrences

There were no previous events identified involving a low power RPS actuation similar to the occurrence described in this licensee event report.

G. Component Failure Data

There were no failed components associated with this event.